

on the head''. They replied that neither of them had heard of it until they read my record.'

Mrs Rodd also wrote from Ansidonia that she had never had puppies in other litters with such marks on their heads, she had not seen Sir John between the birth of the puppy on August 5th, 1954, and the dinner in February when he recounted his dream, and Mrs Edmunds was their only link.

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### THE THEORETICAL BACKGROUND OF 'RANDOMNESS'

SIR,—Mr Fraser Nicol, in his article contributed to this Journal for June 1955, has quoted statisticians as saying that 'randomness' cannot be precisely defined. The situation can be more properly summed up in the statement that all attempted definitions of 'randomness' turn out to be circular, or pretty nearly so. And it is of the utmost importance that this circularity should not be confounded with the 'vagueness' or imprecision which Mr Spencer Brown, in his article in *Nature* (25 July 1953), claimed to have detected in the concept of 'randomness' used in applied probability theory. Vagueness or imprecision would simply rule out any consistent treatment and should make us wonder, like Mr Spencer Brown, how 'present probability theory applied to science' keeps going 'as well as it does'. A certain kind of circularity or tautology in mathematics, on the other hand, is perfectly compatible with a rigorous theory of probability permitting a consistent application of the 'Laws of Great Numbers', i.e. the theorems of Bernoulli and Bayes.

As an instance of what a little circularity in our mathematical definitions of 'randomness' can accomplish, I refer to von Mises' well-known *Wahrscheinlichkeit, Statistik, und Wahrheit* (second edition, Julius Springer, Vienna, 1936). He lays down a condition he calls the 'principle of Excluded System' or 'principle of Indifference to Ordinal Selection' (*Stellungsauswahl*) the scope of which can be understood with the aid of a simple illustration provided by M. G. Kendall (*The Advanced Theory of Statistics*, Vol. I, Charles Griffin, 1943). Suppose we have a population of objects each of which bears only one of two characteristics denoted by 0 and 1 respectively. We draw members from the population taking care to replace each member after drawing. Then the definition of an irregular *Kollektiv* formulated by von Mises requires (a) that the proportion of 0's in the first  $n$  terms tends to a limit as

$n \rightarrow \infty$ , a limit which may be called the probability of o in the *Kollektiv*; (b) that if a subsequence is picked out of the *Kollektiv* by some method which is independent of the *Kollektiv* (for instance, every 3rd member, every member following a o, etc.), the limit of the proportion of o's, as  $n \rightarrow \infty$ , in the subsequence is the same as the limit of o in the whole class; and this is true for every such subsequence. Von Mises attempts to meet the criticism that the phrase 'infinite class for which there is no intrinsic rule of construction' is meaningless or tautological. He points out that the Formalists in mathematical theory need not object so long as the phrase has *not* been shown to be self-contradictory and the Intuitionists in mathematical theory need not object so long as the character of the 'random series' (e.g. the process of drawing from the population of o's and 1's) is exhibited. After criticizing the Laplacean attempts to pass from their *a priori* definitions of probability to empirical frequencies and the '*Spielraum*' or 'Indifference' principle as formulated by von Kries, von Mises shows how his own theory can consistently derive the 'Laws of Great Numbers'.

Some circularity or tautology in our mathematical definitions of 'randomness', then, is perfectly compatible with a theory of probability which is as precise, consistent, and complete as A. A. Robb's Relativistic Geometry of a Conical Order or E. A. Milne's Kinematic Relativity. To suggest that the concept of 'randomness' is 'vague' in 'much the same way as the concept of physical simultaneity is vague', i.e. to suggest that our applied probability theories are in a sort of pre-Einsteinian stage, is misleading and misses the spirit of the modern postulational approaches to the problem. It is no less misleading to suppose that a resolutely empirical approach to 'randomness' will undermine the very foundation of the applied probability theory used in psychical research. It should be clearly realized that various forms of the Frequency theory of probability and various forms of the axiomatic theory of probability are almost completely equivalent for several practical purposes (H. Cramér, *Mathematical Methods of Statistics*, Princeton University Press, 1946, Chapter 13, section 5). The validity of the 'cross-check' method in psychical research has not been appreciably affected by Mr Spencer Brown's criticism. As Professor Broad has reminded us in this Journal (March 1955, pp. 22-3), in the Soal-Goldney experiments the sequence of guesses at the cards actually presented as the targets yielded a critical ratio of the order of over 13 while the same sequence of guesses matched against cards which were not presented as the targets yielded a critical ratio between 1 and 2. It is but fair to ask

whether experiments with random numbers have yielded comparable results. We have to reckon also with statistically significant relationships between changes in the subject's rate of scoring and changes in the experimental conditions.

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## NEWS AND NOTES

### *The Society's Oldest Member*

We offer our warmest felicitations to Mr H. N. Ridley, C.M.G., F.R.S., whose hundredth birthday fell on 10 December. Mr Ridley joined the Society in 1882, the year of its foundation, and has always taken an active interest in its work. It was, indeed, only a few years ago that he sent us an account of a most instructive pseudo-psychical experience, written with typical care and attention to detail. It is in the field of botany that Mr Ridley is best known, for out of his experiments in Singapore, started nearly seventy years ago, grew the technique of treating and 'bleeding' rubber trees which is used to this day in the cultivated rubber industry.

### *B.B.C. Broadcasts*

The events described in 'The Ardachie Case' (pp. 159-72) formed the basis of a broadcast on 6 August 1954 under the title of 'The Frightened Housekeeper'. At that time fictitious names were used for the location and for all the people concerned.

The latest broadcast of a case published by the Society took place on 15 November 1955. This was 'The Dieppe Raid Case', one of the most curious and striking cases which have come our way for many years, which was broadcast in the 'Our Day and Age' series under the title of 'Voices Crying Out'. 'Dorothy Norton' herself spoke briefly in the programme, which employed the same pseudonyms as were printed in the *Journal* report. The scripts of both features were written by Anthony Jacobs.

### *Perrott Studentship*

Mr Trevor Hall's tenure of the Perrott Studentship in Psychical Research at Trinity College, Cambridge, has been renewed for a further year.

### *Notes on New Publications*

The 'Association of the Friends of Parapsychology' recently founded in Buenos Aires (see 'News and Notes', June 1955) has